IN THE SPECIFICATION

Please amend the specification as follows. Paragraphs that are being amended are listed in their entirety; changes are indicated in the left margin with a vertical change bar. Deletions are marked by ~~strikethrough~~; insertions are underlined.

Please amend the paragraph on page 1, line 20 through page 3, line 10, as follows:

Presently lithographers adjust the properties of the illumination source (partial coherence, annularity, etc.) to increase the useable processing window. See, for example, "High Throughput Wafer Steppers with Automatically Adjustable Conventional and Annular Illumination Modes", J. Mulkens ~~et al.,~~ et al. As used herein, "illumination source" means the collective effect of the pre-reticle optics (such as mirrors, homogenators, lenses, polarizers, diffusers, etc.) and the light source (mercury arc lamp, excimer laser, synchrotron radiation, etc.) on creating a radiant intensity pattern (energy per unit solid angle) at the reticle. For Kohler Illumination (*see, for example,* "Principles of Optics", M. Born et al., *Pergamon Press*, 524:526), the source on a particular machine, and for a particular machine setting, is completely characterized by the radiant intensity given by:

$$\frac{dE}{do}(nx, ny; x, y) = \text{energy per unit solid angle coming from direction (nx,ny) and at transverse spatial position (x,y) on the reticle} \quad \text{(Eq. 1)}.$$

The ability to predict lithographic performance, especially cross-field or machine to machine variation, is contingent on quantitatively knowing the factors causing variation and this includes the illumination source $\left(\frac{dE}{do}\text{ of Equation 1}\right)$. The effect of the illumination source ~~(source)~~ when coupled to projection imaging objective (PIO, or lens that relay the reticle object plane to the wafer plane) aberrations has been documented,

as has the deleterious effects of improperly or non-optimally configured sources themselves on lithographic printing. See, for example, "Differences of Pattern Displacement Error Under Different Illumination Conditions", N. Seong et al., *SPIE*, Vol. 3334, 868:872, 1998; "Effect of Off-Axis Illumination on Stepper Overlay", N. Farrar, *SPIE*, Vol. 2439, 273:275, 1995; "Overlay Error Due to Lens Coma and Asymmetric Illumination Dependence", H. Nomura et al., *SPIE*, Vol. 3332, 199:210, 1998; and see "The Effects of an Incorrect Condenser Lens Setup on Reduction Lens Printing Capabilities", D. Peters, *Interface 85*, Kodak Publ. No. G-154, 66:72, 1985; "Impact of Local Partial Coherence Variations on Exposure Tool Performance", Y. Borodovsky, *SPIE*, Vol. 2440, 750:770, 1995; "Condenser Aberrations in Kohler Illumination", D. Goodman et al., *SPIE*, Vol. 922, 108:134, 1988; "Mathematical Treatment of Condenser Aberrations and their Impact on Linewidth Control", C. Krautschik et al., *Intel*, 1:12, 1998; "Examples of Illumination Source Effects on Imaging Performance", A.J. deRuyter et al., *ARCH Chemicals Microlithography Symposium*, 2003. Comprehensive modeling will generally require knowing the radiant intensity across the projection field, machine settings, and machines. See, for example, "Understanding Systematic and Random CD Variations using Predictive Modeling Techniques", D. Flagello et al., *SPIE*, Vol. 3679, 162:175, March 1999; "Understanding Across Chip Line Width Variation: The First Step Toward Optical Proximity Correction", L. Liebmann et al., *SPIE*, Vol. 3051, 124:136, 1997.

Please amend the paragraph beginning on page 5, line 7, as follows:

Figure 5 shows a ray trace diagram for ISIO of the first main ~~embodiment~~ embodiment.

Please amend the paragraph beginning on page 9, line 20, through page 10, line 2, as follows:

Another design point, referring to Figure 1, with a chrome opening CO in a chrome coating on the reticle face RF, is large enough to allow the entire source as represented by the marginal imaging point MIP of Figure 5 to pass. One of the main ~~reason~~ reasons for keeping some chrome coating is to reduce stray light reflection off of the reticle.

Please amend the paragraph beginning on page 5, lines 6-20, as follows:

When recording the source images in photoresist on a wafer, the process flow of Figure 19 is used. First an MFISIO as described herein is provided and loaded onto the machine we are characterizing. Next a resist coated substrate (wafer) is provided and loaded on the machine. Next, the substrate is exposed at multiple, increasing exposure doses at discretely separated image fields on a ~~wafer~~ wafer. See, for example, page 3 of "Examples of Illumination Source Effects on Imaging Performance" by A.J. de Ruyter et. al. in 2003 ARCH Chemicals Microlithography Symposium, *supra*. The substrate is then developed and the exposed images are photographed one by one. From these images and knowledge of the exposure dose sequence, the 'raw' intensity contours of $\frac{dE}{do}(nx, ny)$ are obtained. Next these intensity contours are computationally overlapped and the radiometric and the exit pupil transmission correction factor (Equation 4) are applied to reconstruct the normalized radiant intensity (Figure 21):

$$R(nx, ny; x, y) = \frac{1}{N} \frac{dE}{do}(nx, ny; x, y) \qquad \text{(Equation 10)}$$

where:

$$N = \int do_{\bar{n}} \frac{dE}{do}(nx, ny; x, y) \text{ the normalization} \qquad \text{(Equation 11)}$$